

CprE / EE 492 - Sdmay18-25

## Bi-Weekly Report 5

### Autonomous Health Monitoring of Civil Infrastructure using UAV

Start Date - End Date: Mar. 9 - Mar. 23

Faculty Advisor: Dr. Halil Ceylan

#### Team Members:

Nathan Conroy - Software Lead

Kevin Yen - Hardware Lead

Quade Spellman - Meeting Facilitator

Isaac Bries - Test Engineer

Molly Hayes - Meeting Scribe

Rishab Sharma - Report Manager

#### Past Week Accomplishments

All of our parts have arrived and we have picked them up from ETG and put them in our locker in the senior design room. Our motors, drone propellers, power connectors, and the telemetry unit have arrived, and we now have all the parts needed to start assembly.

These past weeks we have laid out detailed plans to build the main drone frame, and figuring out ways how to attach all the sensors. The process of building the drone has started and we could not be happier. We are looking to complete building the drone by the end of this month so that the testing process can begin as soon as possible.

One of our major part that arrived is the Flir thermal camera, and we have figured out one way of how it connects with the computer for power and video viewing. We figured out that there is a Flir app on the phone that can be helpful. You can connect it with to the camera from the app with bluetooth and you can control it from there for recording, settings, etc. We are thinking that for programming it we'll us Mavlink, as well as PWM for control. Mavlink is used for camera control and PWM is used for switching options while flying. This can also be worked out through the app.

We ran into a problem earlier in the semester of the motors and propellers not matching, but that has been solved. We have all the necessary pieces to build the drone and hopefully we

should have it built by the next weekly report. We will get into more technical detail in the next report when we have finished most of our assembly.

Here is the list of all the parts that we have ordered so far this semester, just to keep a log of what we are using to build our drone. Here are the parts:

First Order						
Name	Description	Supplier	Units	Qty	Cost (each)	Cost Total
Tarot T960	Frame	robotshop.com	1	1	\$299	\$299
Tarot T810 T960 T1000 Multi-Rotor Foldable Landing Gear	Landing Gear	hobbyking.com	1	1	\$68.40	\$68.40
Tarot T810 T960 Gimbal Mount Kit	Mounting Rail	hobbyking.com	1	1	\$16.95	\$16.95
Here GNSS/GPS for Pixhawk 2.1	GPS	robotshop.com	1	1	\$48.00	\$48.00
Pixhawk 2.1	Flight Controller	robotshop.com	1	1	\$198	\$198
HKPilot Transceiver	3DR Radio Telemetry	hobbyking.com	1	1	\$32.67	\$32.67
FrSky Transais Qx7	Radio Transmitter	hobbyking.com	1	1	\$104.99	\$104.99
FrSky X8R	Radio Receiver	hobbyking.com	1	1	\$36.80	\$36.80
Tiger Motor Flame 80A	Electronic Speed Controller	tmotor.com	1	7	\$119.99	\$839.93
P80 Kv100	Motor	tmotor.com	1	8	\$199.90	\$1,599.20
T-Motor G29x9.5	Propellers	tmotor.com	2	4	\$270.90	\$1,083.60
Venom 13000mAh 22.2V	Battery	venompower.com	2	1	\$413	\$413
Venom Pro Touch Screen HD 45A RC	Battery Charger	venompower.com	1	1	\$239.99	\$239.99

					<b>Subtotal</b>	\$4,981
<b>Second Order</b>						
Name	Description	Supplier	Units	Qty	Cost (each)	Cost Total
jD-RF900Plus Longrange	Long Range telemetry	JDrones	1	1	\$259.95	\$259.95
Flir vue pro R, 30hz, 640x512, 13mm lens	Thermal Camrera	Flir	1	1	\$4,699.00	\$4,699.00
Tarot TL03FLIR	Thermal Gimbal	Alibaba	1	1	\$176.00	\$176.00
HS-200-HV 14S	Power Module	Craft&Theory	1	1	\$27.00	\$27.00
4-14S HYB-BEC / 5.30V DF13-4P	Power Module BEC	Craft&Theory	1	1	\$36.00	\$36.00
HS adapter cable for Pixhawk 2	Power Module cable	Craft&Theory	1	1	\$5.00	\$5.00
Tarot 1755 Carbon Propellers	Motor Propellers	GetFPV	2	3	\$71.90	\$215.70
U7-V2.0 KV420	Motor	GetFPV	1	6	\$149.90	\$899.40
XT150 Charge lead w/6mm Gold Connectors	Connectors	MotionRC	1	1	\$4.06	\$4.06
					<b>Subtotal</b>	\$6,322.11
					<b>Sum of Both Orders</b>	\$11,303
					Cost of unusable parts	\$2,682.80

Pending Issues

The parts have arrived and we are starting to attach parts like the motors, propellers, and batteries to the frame. This is just the start and now all that needs to be done for us is to finish what we have started, and make sure to be thorough so there is minimal to no errors.

### Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Nathan Conroy	Started working with Flir Camera	3	93
Kevin Yen	Worked with a student from the Aerospace program to assemble UAV system	2	72
Quade Spellman	Continued contacting companies looking for gimbals that work with our frame and the Flir camera		56.5
Isaac Bries	Worked with a student from the Aerospace program to assemble UAV system	2	72
Molly Hayes	Organized meetings with Aerospace student, met with student to assess parts and plan assembly, started assembly	4	48.5
Rishab Sharma	Started working on how to build drone.	2	65

### Plans for Upcoming Week

- Continue our research on how to fly and use the sensors so we will have an easier time setting it up.
  - How are we transferring video to the pilot? (drone image preview capabilities) streaming in HD?

- What environments do you operate your drone in? For example have you ever tried light rain? How do you protect the drone?
  - What do you view your live video feed on? What device?
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- Start building the drone frame, attaching sensors, and other parts as they come.
  - Have set goals to try and finish building our drone by end of March or beginning of April and begin testing in the month of April